Preparing Youth for the Impact of GAI

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Chief Economist, LinkedIn

November 2023
LinkedIn is a marketplace that connects over 1 billion professionals globally

1B
Members

65M
Companies
across 200 countries & territories

130K
Schools

41K
Skills
Insights from the Economic Graph
LinkedIn believes in a future of work that is **equitable**, **sustainable**, and **resilient**

- **Equitable**
  - Opportunity for All
  - Shedding a light on where opportunity gaps exist and how we can create more equitable outcomes for the workforce.

- **Sustainable**
  - Sustainable Economy
  - Providing unique insights on emerging green job and skills trends and how we can work to help address the urgent climate crisis.

- **Resilient**
  - Career Pathways | Digital Economy
  - Enabling career mobility and resilience by understanding how disruptive technologies and skills are changing the work we do and how employers are hiring.
Today

1. Surprise! AI skills are increasing quickly across the globe

2. Generative AI will change the skills required for many of our jobs

3. GAI skills disruption will not occur evenly by industry, age, or gender

4. So what?
9x more AI talent in June 2023 than January 2016

Singapore, Finland, Ireland, India, and Canada are experiencing fastest rate of AI skills diffusion
In 2022, the five fastest-growing AI-related skills added to LinkedIn member profiles, were all skills hinting at the emergence of GAII:

- **Question Answering:** +332%
- **Classification:** +43%
- **Recommender Systems:** +40%
- **Computer Vision:** +32%
- **Natural Language Processing (NLP):** +19%

In the last five years, the number of US LinkedIn members in “Head of AI” roles has nearly tripled.
**AI**

Artificial Intelligence (Algorithmic Inference)

**GAI**

Generative AI

**GPT**

Generative Pre-Trained Transformer

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**GAI keywords**

- **25%** Since early April, the number of LinkedIn member posts mentioning GAI keywords in the US has increased 25% month over month.

**Member profiles and job postings**

- **75%** Since the start of the year, we’ve seen on average a 75% increase each month in members worldwide adding terms like “GAI,” “ChatGPT,” “Prompt Engineering,” and “Prompt Crafting,” to their profile.

- **15x** In June, members added these keywords to their profiles 15x more frequently than in January.
Generative AI is just one of many factors shifting skill sets...

Prior to GAI, 60% change in jobs skill sets by 2030

With GAI, 65% change in jobs skill sets by 2030

Source: LinkedIn Economic Graph Research Institute
...but it does have the potential to shift skill sets for many of us.

**Share of LinkedIn Members by Exposure to Gen AI and Country, 2023**
Identify GAI-replicable and GAI-complementary skills

Assess the share of each occupations’ skills that are GAI-replicable and complementary

Categorize occupations by degree of exposure to GAI

How did we determine this?

1. Identify GAI-replicable and GAI-complementary skills
2. Assess the share of each occupations’ skills that are GAI-replicable and complementary
3. Categorize occupations by degree of exposure to GAI

LinkedIn researchers identified a list of over 500 skills likely to be affected by GAI technologies, including these skills that are among the most frequently featured by members:

**Business and industry:** Financial Reporting, Email Marketing, Data Analysis

**Communication and media:** Writing, Editing, Documentation, Translation, Content Creation

**Engineering:** Software Development Tools, Programming Languages, Data Science

**People:** Time Management Tools
<table>
<thead>
<tr>
<th>Occupation</th>
<th>Share of skills potentially augmentable by GAI</th>
<th>Top skills potentially augmentable by GAI: Top skills that could be partly performed by GAI-assisted software</th>
<th>Top people skills and specialized skills: Top skills that need to be performed by humans, and that complement skills potentially augmented by GAI</th>
<th>Share of people skills and specialized skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>45%</td>
<td>Lesson Planning, Curriculum Development, Teacher Training, Literacy, Tutoring</td>
<td>Classroom Management, Differentiated Instruction, Elementary Education, Educational Technology, Special Education</td>
<td>53%</td>
</tr>
<tr>
<td>Software Engineer</td>
<td>96%</td>
<td>Jenkins, Docker Products, Angular.js, TypeScript, Git</td>
<td>Java, Agile Methodologies, Microsoft Azure</td>
<td>3%</td>
</tr>
<tr>
<td>Nurse</td>
<td>6%</td>
<td>Patient Care, Quality Patient Care, Patient Assessment</td>
<td>Advanced Cardiac Life Support (ACLS), Nursing, Basic Life Support (BLS), Acute Care, Critical Care Nursing</td>
<td>91%</td>
</tr>
<tr>
<td>Salesperson</td>
<td>59%</td>
<td>Cold Calling, Retail Sales, Outside Sales, Sales Processes, Inside Sales</td>
<td>Stocking, Hospital Sales, Cardiology, Endocrinology, Medical Sales</td>
<td>15%</td>
</tr>
<tr>
<td>Project Manager</td>
<td>28%</td>
<td>Scrum, Submissions, Software Development Life Cycle (SDLC), Agile Methodologies, Agile Project Management</td>
<td>Construction Management, Project Estimation, Pre-Construction, Value Engineering, Change Orders</td>
<td>44%</td>
</tr>
<tr>
<td>Customer Service Rep.</td>
<td>76%</td>
<td>Phone Etiquette, Typing, Customer Support</td>
<td>Warranties, Food and Beverage Operations, Stocking, Hospitality Service, Dispatching</td>
<td>4%</td>
</tr>
<tr>
<td>Driver</td>
<td>9%</td>
<td>Warehouse Operations, Logistics Management, Freight Transportation Planning</td>
<td>Truck Driving, Professional Driving, CDL Class A, CDL, Commercial Driving</td>
<td>88%</td>
</tr>
<tr>
<td>Medical Doctor</td>
<td>7%</td>
<td>Medical Research, Cancer, Heart Disease</td>
<td>Medical Education, Internal Medicine, Surgery, General Surgery, Family Medicine</td>
<td>63%</td>
</tr>
<tr>
<td>Cashier</td>
<td>59%</td>
<td>Food Service Planning, Merchandising</td>
<td>Stocking, Fast Food, Waiting Tables, Food and Beverage Operations</td>
<td>22%</td>
</tr>
<tr>
<td>Childcare Provider</td>
<td>20%</td>
<td>Lesson Planning, Tutoring</td>
<td>Childcare, Working with Children, Babysitting, Child Development, Nannyng</td>
<td>76%</td>
</tr>
<tr>
<td>Environmental Health Safety Specialist</td>
<td>3%</td>
<td>Risk Assessment, Root Cause Analysis, Geographic Information Systems (GIS)</td>
<td>Environment, Health, and Safety (EHS), Accident Investigation, Occupational Health, Industrial Hygiene, Environmental Compliance</td>
<td>70%</td>
</tr>
<tr>
<td>Event Manager</td>
<td>39%</td>
<td>Event Marketing, Hospitality Management, Catering Planning, Virtual Events</td>
<td>Corporate Events, Event Production, Special Events, Meeting Planning, Private Events</td>
<td>44%</td>
</tr>
<tr>
<td>Construction Specialist</td>
<td>11%</td>
<td>Construction Drawings, Submissions, Revit</td>
<td>Construction Management, Construction, Flooring, Construction Safety, Pre-Construction</td>
<td>78%</td>
</tr>
<tr>
<td>Oil Field Operator</td>
<td>1%</td>
<td>Project Commissioning, Preventive Maintenance Planning</td>
<td>Oil and Gas Drilling, Rig, Offshore, Well Control, Directional Drilling</td>
<td>89%</td>
</tr>
</tbody>
</table>

Note: Percentages may not add up to 100% due to some skills not falling under these categories.
We categorized occupations as augmented, disrupted, or insulated

<table>
<thead>
<tr>
<th>Group</th>
<th>Impact on occupations</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented by GAI</td>
<td>GAI may affect a relatively large portion of the skills in these jobs, leaving more time for higher value-added complementary skills.</td>
<td>Data Analysts automate the computation and interpretation of metrics with GAI, enabling them to focus their time on GAI-complementary skills, such as cross-functional influencing and stakeholder engagement.</td>
</tr>
<tr>
<td>Disrupted by GAI</td>
<td>As GAI is adopted more broadly, these jobs will undergo reskilling, possibly leading to more innovation.</td>
<td>Language translators’ skills shift from doing translations from scratch to reviewing and certifying machine-generated translations, or to specializing on specific legal or literary domains.</td>
</tr>
<tr>
<td>Insulated from GAI</td>
<td>As these jobs are relatively protected from the influence of GAI, their core skills are likely to remain unchanged in the near term. Some of these jobs tend to be susceptible to other forms of automation, such as robotics.</td>
<td>Real estate agents might utilize GAI for writing house descriptions, but core relationship management skills would be insulated from GAI.</td>
</tr>
</tbody>
</table>

Source: LinkedIn Economic Graph Research Institute
Replicability is key to how GAI will affect jobs

Source: LinkedIn Economic Graph Research Institute
Disruption may disproportionally affect tech/professional services

Share of Indonesian Members, by Exposure Category and Industry

- Retail
- Technology, Information and Media
- Wholesale
- Financial Services
- Professional Services
- Manufacturing
- Real Estate and Equipment Rental Services
- Holding Companies
- Administrative and Support Services
- Utilities
- Consumer Services
- Education
- Entertainment Providers
- Farming, Ranching, Forestry
- Transportation, Logistics, Supply Chain and Storage
- Accommodation and Food Services
- Construction
- Government Administration
- Oil, Gas, and Mining
- Hospitals and Health Care

Disrupted  Augmented  Insulated
Roles currently occupied by youth are more likely to face disruption

- Youth are more likely to occupy junior roles that are responsible for more replicable tasks
- In many places, they may also be more fluent in technology, preparing them to better leverage GAI for those roles
Roles currently occupied by women are more likely to face disruption

- Historic and ongoing barriers to women’s labor market participation and advancement have reduced average tenure and seniority, potentially explaining why—like youth—women face more disruption.

- This makes interventions aimed at achieving labor market equity even more critical now.
Equitable access requires investment
Without digital infrastructure and broad data ecosystems, many professionals will not be able to leverage AI, or may be stuck with AI tools that do not reflect local needs and realities.

Pedagogy will need to keep up more than ever
What we teach and how we teach it will change, as it always has—but the necessary rate of change may increase as we re-assess the value of skills long-assumed to be critical.

Systems for assessing and tracking skills need to improve
Formal degrees and past work experience may be increasingly less important in signaling skill competence, which will require better systems for tracking and facilitating skill development.
Generative AI and the Future of Work

The context of Africa

November 2023

Discussion: Marcio Cruz
Africa has a small number of “firms” able to generate good-quality jobs

About 3 million firms with 5+ workers (2 million are formal). Less than 20% of the labor force work for firms with 20+ workers.

About 70% of the labor force work with micro-businesses. Mostly informal self-employed.

Panel a. Enterprises with 5+ workers

Panel b. Micro businesses
Better jobs for more people require more and better firms
Most firms are far from the technology frontier

Advanced economies have many more sophisticated firms

Estimated Technology Sophistication by Country, Manufacturing

Estimated Technology Sophistication, Number of workers, and Number of firms (bubble)

Source: Cirera, Comin, and Cruz (2022)
Digital Entrepreneurship can be an enabler of tech diffusion, but the “premium” for disruptiveness is low in Africa.

Key disruptive technologies incorporated by African digital tech startups are related to mobile payments and cloud computing.

Digital tech startups incorporate more disruptive technologies relative to older ones.
Questions:

1) What can AI do to facilitate technology diffusion and the creation of a larger number of good-quality firms?

2) Who may benefit most? (The distributional effects)

3) How can we build strong market incentives to direct AI solutions towards entrepreneurship and labor complementary tasks? (Policies)
Artificial Intelligence and the Labour Market

7 November 2023
S4YE Partner Summit 2023

Stijn Broecke
Senior Economist

http://oe.cd/employment-outlook
There is little evidence of significant employment effects of AI so far

*AI impact on overall employment in company*

% of employers in manufacturing and finance sectors who say that employment has increased/decreased/stayed the same

- Increased
- Decreased
- No effect
- Don't know
Many workers are worried about job loss to AI

Share of workers worried about losing their job to AI in the next 10 years

% of workers

- Extremely worried
- Very worried
- Moderately worried
- Slightly worried
- Not worried at all
- Don't know

© OECD | OECD Employment Outlook 2023
The risk of automation remains significant

Share of employment in occupations at the highest risk of automation by country, 2019
AI can have a positive effect on job quality

The impact of AI on performance and working conditions

% of workers who work with AI

- Improved it a lot
- Improved it a little
- Worsened it a little
- Worsened it a lot
- No effect
- Don't know

Performance  Enjoyment  Physical Health  Mental Health
Investing in skills will be important

Share of employers saying lack of skills is a barrier to adopting AI

% of employers

United Kingdom  France  Canada  Ireland  Austria  Germany  United States
Social dialogue can lead to better outcomes

The impact of AI on performance and working conditions, by worker consultation

% of workers who work with AI

<table>
<thead>
<tr>
<th></th>
<th>Consulted</th>
<th>Not Consulted</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improved it a lot</td>
<td>Improved it a little</td>
</tr>
<tr>
<td>B. Mental health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improved it a lot</td>
<td>Improved it a little</td>
</tr>
</tbody>
</table>
Youth may be at particular risk

• More precarious contracts
• Labour market adjustments often happen through young people entering new kinds of jobs
• AI is a general purpose technology that will affect all sectors and occupations
• The speed of development/adoPTION will be a challenge
Thank you

Find out more about our work at:

http://oe.cd/employment-outlook

https://twitter.com/StijnBroecke
https://twitter.com/OECD_Social